HYPERION EOS 5i DP AC/DC

EOS5IDP-AD-A with A123 Battery Mode

User's Manual

Power, with Ease

HYPERION EOS 5i DP AC/DC - User's Manual

EOS 5i DP AC/DC Special Features

*Two INPUT power choices: Use AC 100~240V at home, or DC 11~15V anywhere
*Powerful, yet compact and portable with wide support for various battery types
*Charge / Discharge Modes
*Clear and easily readable LCD Screen with Warning messages for common setup errors
*Packaged in a rugged aluminum case - Output harness included - Long Input leads
*Specially designed to be 100% Compatible with PCM Guard and Balancer Adapters
*DataPort Interface for EOS LBA 10 Balancers (see last page of manual for details)

Specifications

Input voltage range	100~240V AC OR 11.0-15.0V DC (only one source may be connected at a time!)
Appropriate battery types and range of series-connected cells	1-14 Nickel-Cadmium cells
	1-14 Nickel-Metal Hydride cells
	1-5 Lithium cells, 100~5000mAh (3.7V/cell type)
	1-6 A123-Brand Cells (3.3V/cell type)
	1-6 Lead-Acid cells (2V per cell nominal)
Charge current	0.1A ~ 5A MAX, by 100mA steps (50W limit)
Discharge current	0.1A ~ 1A MAX, by 10mA steps (5W limit)
Trickle charge current (NiCd, NiMH)	0 ~ 200mA
Charge termination	"zero delta V" peak detection for NiCd/NiMH
	"CV/CC" for Lithium, A123, Lead-Acid Batteries
Cycling Modes (NiCd, NiMH)	Charge>Discharge and Discharge>Charge
Display type	2-line, 16 backlit character LCD

Safety precautions

- **KEEP CHARGER AWAY FROM CHILDREN AND PETS AT ALL TIMES!**
- **This charger is ONLY for NiCd/NiMH, Lithium(3.7V/cell), A123(3.3V/cell), and Lead-Acid (2.0V/cell) type cells. DO NOT connect other, such as 3.6V/cell Lithium, or non-rechargeable batteries!**
- **Always place the charger on a firm, level, and fireproof surface for charging.**
- **Do not place the battery or charger on or near flammable materials while in use. Keep away from carpets, cluttered workbenches, etc.**
- **Do not exceed cell manufacturer's suggested max charge rates**
- **Do not use automotive type battery chargers to power the charger.**
- **Do not leave the charger unattended while charging.**
- **Disconnect the battery and remove input power from charger immediately if the charger becomes hot. Allow the charger or battery to cool down before reconnecting.**
- **Do not allow water, moisture or foreign objects into the charger.**
- **Do not open the charger, nor attempt any repair. It is dangerous, and will void your warranty.**
- **Do not obstruct the air intake holes on the charger.**
- **ALWAYS follow correct connection sequence, as given below**
- **CAREFULLY FOLLOW THE BATTERY PACK MAKER'S RECOMMENDATIONS AND SAFETY ADVICE!**

Using the EOS 5i DP AC/DC

The EOS 5i includes an Output Harness with two 4mm male "banana" connectors attached. First, solder your chosen battery connector to the bare wire ends of the harness, taking great care to observe proper polarity.

ALWAYS FOLLOW this connection sequence, and reverse sequence to disconnect:

1) Connect OUTPUT harness to the sockets located on the right side of the charger.
Take care that the Output Harness RED wire bullet connector goes to the (+) socket, and BLACK wire to (-) .

2a) Connect Charger INPUT alligator clips to an appropriate DC power source:
   a) A 12V automobile battery
   b) A quality, low-noise DC power supply of 12~15V with 5A+ rating (large batteries may require 10A supply)

OR

2b) Connect to AC wall power 100~240V using the supplied AC adapter cable

DO NOT CONNECT BOTH AC AND DC INPUT AT THE SAME TIME!!
The Charger will display INPUT VOLTAGE error message if input voltage is out of range. If this happens, please recheck the input power supply to make sure correct voltage is present.

3) Set the battery type using the charger configuration buttons.

*The **INC** and **DEC** buttons are used to **Inc**rease or **Dec**rease values, such as Charge Current or Cell Count

*The **INC** and **DEC** buttons are also used to select **MODE**, such as Charge, Discharge, or Cycle

*The **BATT TYPE** and **ENTER** buttons both have two modes: SHORT press or LONG (~1 second) press

- Short press **BATT TYPE**: Scroll battery types
- Long press **BATT TYPE**: View input/output Data
- Short press **ENTER**: Scroll settings for a battery type. Values will blink when selected. If nothing is changed, blinking will stop. Short press Enter until re-selected, then INC/DEC to change values.
- Long press **ENTER**: START charging (or discharging, or cycling)

Let's start by using a NiMh battery as an example.

When the charger is first connected to input power, it will display the previously used battery configuration. This is especially convenient if you often charge the same type of battery.

1) If **NIMH** is not shown, short push the **BATT TYPE** button to scroll through all battery types. Stop when you reach **NIMH**.
2) Short press the **ENTER** button to select "C", charge rate in Ampere
3) Press INC or DEC buttons to choose the proper rate for your battery pack.
Charging NiCd and NiMH is mostly automatic, and the setup routines are the same for both. You only need to consult the documentation for your battery pack (or ask your dealer) to determine the proper charge current in Ampere (A). If the rate is given in mA, note that 100mA equals 0.1A: so 900mA would be 0.9A, for example.
4) Attach your NiMH battery to the EOS 5i Output side harness, checking that +/- polarity is correct.
5) Long press **ENTER** button (hold down for about 1 second) to begin charging
   NO BATTERY error - if battery not connected
   OPEN CIRCUIT error - if the battery becomes disconnected from the charger after START
   REVERSE POLARITY error - if the battery is connected in reverse
   DATA RANGE OVER ERROR - EOSLBA10 Balancer and EOS5i Charger Battery Type Settings are not the same

In our NiMH charging example above, we pressed the **ENTER** button when "**NiMH**" was blinking, to go directly to charge rate setting. However, if you want to enter **DISCHARGE** or **CYCLE** modes, you can press the **BATT TYPE** button to start **NiMH** blinking, then press **INC/DEC** buttons to scroll through the various modes. Once the mode is settled (like **CYCLE**), short press **ENTER** to start values blinking for editing.

Below are the flow charts for all the settings in the charger for each battery type

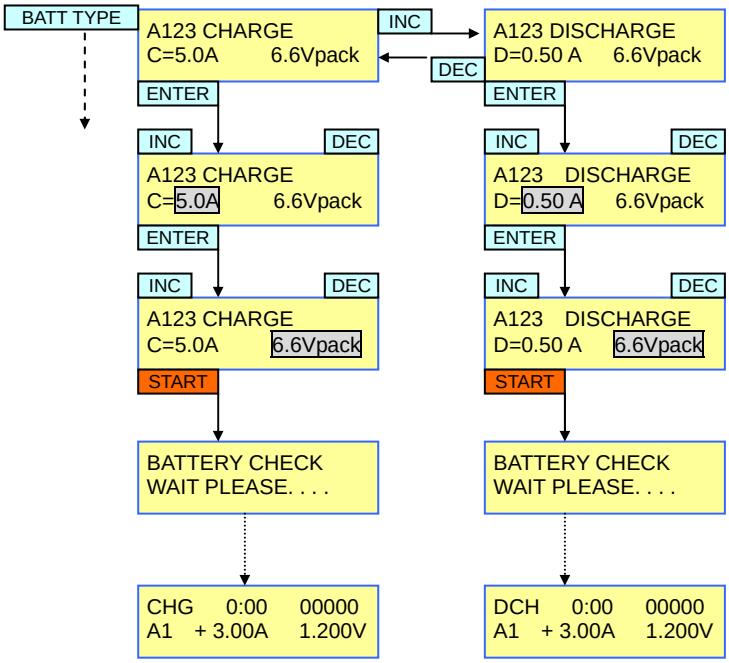
A123 MODE

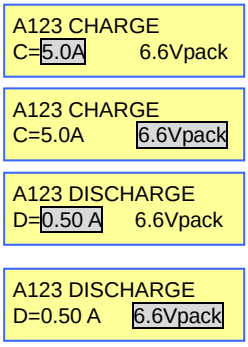
The A123 charge/discharge modes are intended for cells with 3.3V nominal, produced by A123 Company ONLY! While the EOS5i A123 charge mode MAY work with other lithium cells having 3.3V nominal voltage, Hyperion strictly cautions against charging other-brand cells with EOS 5i A123 routine. **Customers who use A123 mode to charge other-brand cells assume all risk.**

Due to the nature of A123 cells, one MUST ALWAYS use a cell balancer when using A123 Mode. The original Hyperion EOSLBA10 can be used, but was originally designed for Lithium Polymer batteries. The EOSLBA10 Balancer function works well with A123, but the overcharge and discharge protection voltages are higher than optimal for A123. Note also that if **original** LBA10 (w/o A123 mode) is used, connecting LBA10 to EOS5i via DataPort Cable will result in the DATA RANGE OVER error warning. For best results, **EOSLBA10-A** (with LIPO and A123 modes) should be used; when in A123 mode, version **EOSLBA10-A** provides correct protection voltages for A123 cells - both for over-charge and over-discharge conditions. EOSLBA10**-A should be connected to EOS Charger via DataPort Cable** (#HP- EOSLBA10-DPC).

To help distinguish between Lithium Polymer and A123 Modes, the screen for A123 CELL COUNT lists pack voltages, rather than "S" count as in LIPO mode. Use the chart below if your pack does not list voltage.

Number of A123 Cells Wired in Series (Pack Voltage)					
1S **3.3V**	2S **6.6V**	3S **9.9V**	4S **13.2V**	5S **16.5V**	6S **19.8V**





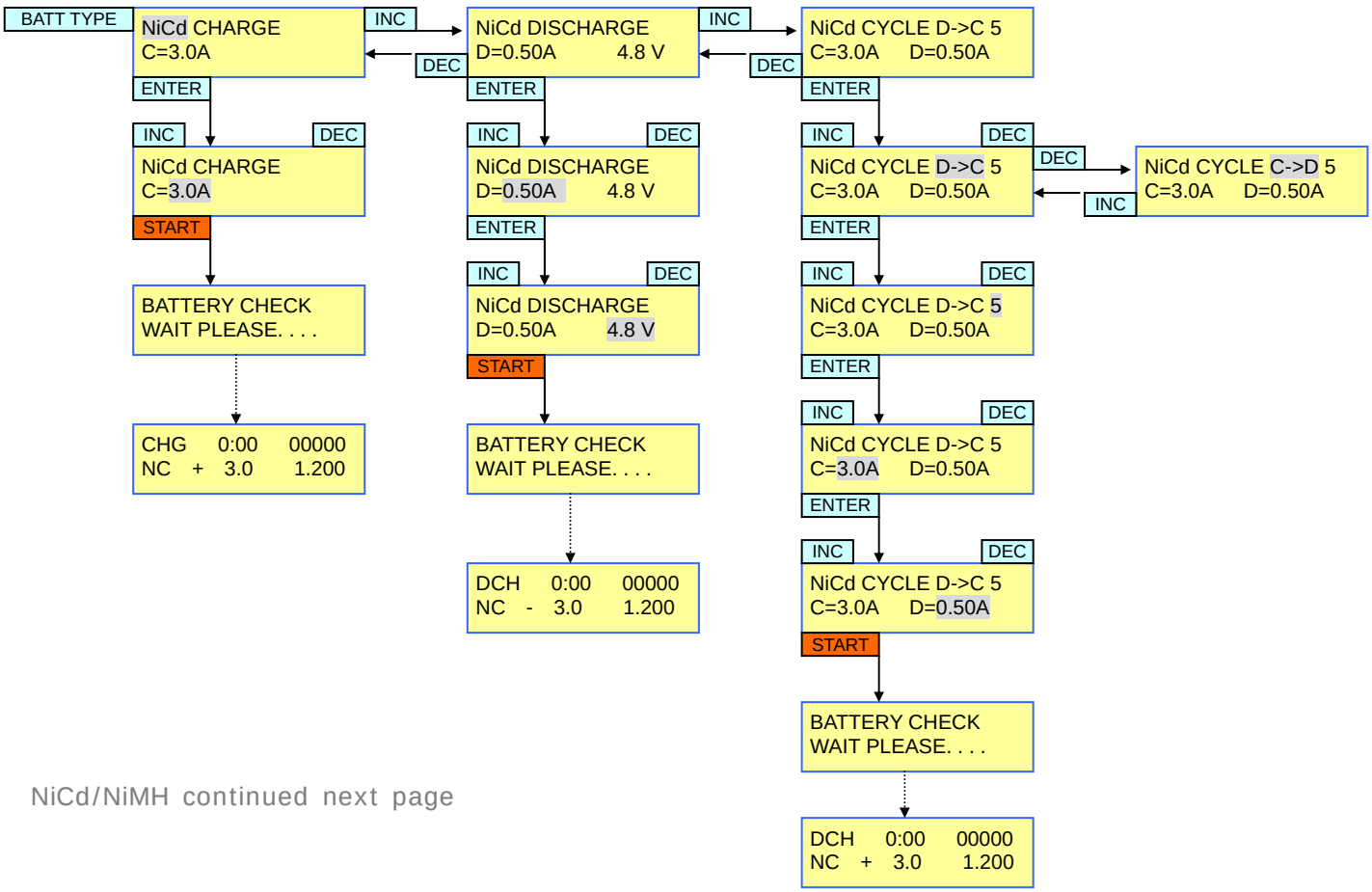
Setting charge current
Adjust and find the desired charge current which ranges from 0.1A to 5.0A with the INC & DEC buttons. Press the ENTER button to confirm the setting.

Setting battery charge voltages for A123 battery pack
Select the proper total PACK voltage to be charged or discharged with the INC & DEC buttons. 3.3V, 6.6V, 9.9V, 13.2V, 16.5V, or 19.8V [Vpack]

Setting discharge current
Adjust and find the desired discharge current from 0.10A to 1.00A (0.01A per step) with the INC & DEC buttons. Press the ENTER button to confirm the setting.

Setting battery discharge voltages for A123 battery pack
Select the proper total battery voltages to be charged or discharged with the INC & DEC buttons 3.3V, 6.6V, 9.9V, 13.2V, 16.5V, or 19.8V [Vpack] Autocut occurs automatically at 2.9V per cell.

NiCd / NiMh MODE (NiMh mode is the same as below, except Mode shows 'NiMH')



NiCd/NiMH continued next page

NiCd CHARGE
C=3.0A

NiCd DISCHARGE
D=0.50A 4.8 V

NiCd DISCHARGE
D=0.50A 4.8 V

NiCd CYCLE C->D 5
C=3.0A D=0.50A

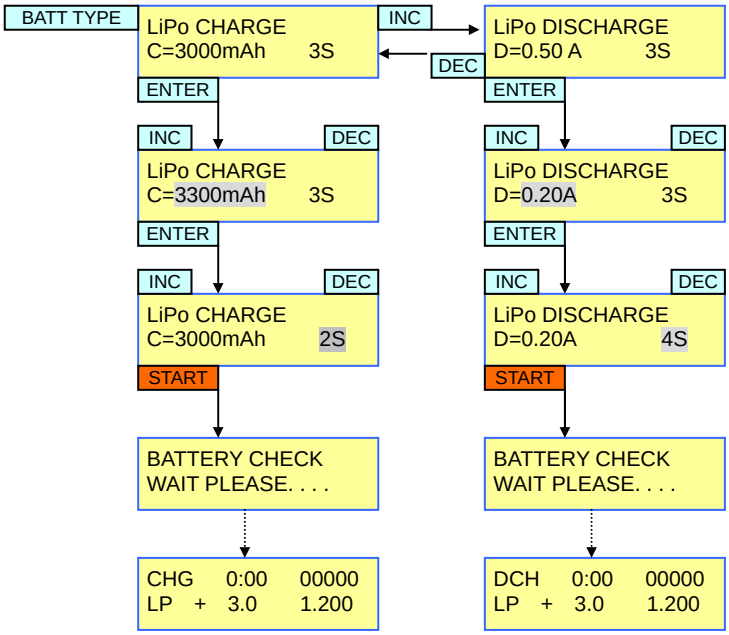
Setting charge current
Adjust and find the desired charge current which ranges from 0.1A to 5.0A with INC & DEC buttons. Press the ENTER button to confirm setting.

Setting discharge current
Adjust and find the desired discharge current, ranging from 0.1A to 1A, with INC & DEC buttons. Press the ENTER button to confirm setting.

Setting discharge cutoff voltage
This is the voltage that the charger should stop discharging the battery.
Adjust and find total discharge cutoff voltages to be discharged from 0.1V to 16.8V with INC & DEC buttons. Press the ENTER button to confirm setting.

Setting cycle
This is to set cycling with two options (Charge to Discharge / Discharge to Charge). Set cycling with INC & DEC buttons, and press the ENTER button to confirm setting.

LITHIUM POLYMER/ION MODE (for 3.7V/cell types only!)



LiPo CHARGE
C=3000mAh 2S

Setting LiPo battery capacity
Adjust and set the desired battery capacity from 100mAh to 5000mAh with INC & DEC buttons (50mAh per step). Press the ENTER button to confirm setting. Charge rate is set on the basis of selected capacity, at 1C rate. Example : Li-Po cell of 1500mAh capacity : 1C = 1500mAh (= 1.5A). If your battery is larger than 5000mAh, you can charge it at the 5000mAh setting, but it will just take longer to finish charging.

LiPo CHARGE
C=3000mAh 3S

Setting battery voltages for LiPo battery packs
Select the total battery voltage to be charged with INC & DEC buttons: 1S=3.7V - single cell
2S = 7.4V - two-cell series pack
3S = 11.1V - three-cell series pack
4S = 14.8V - four-cell series pack
5S = 18.5V- five-cell series pack
NOTE: The EOS Series chargers have intelligent detection routines to help you avoid making mistakes, and LOW or HIGH VOLTAGE errors are displayed if battery voltage does not match your setting. HOWEVER, under some circumstances, especially with over-discharged or damaged batteries, the safeguard could fail. *Therefore, be absolutely sure that you have correctly set pack voltage correctly before charging, every time!* Using LBA cell balancer with EOS Charger is STRONGLY recommended, as it greatly increases safety.

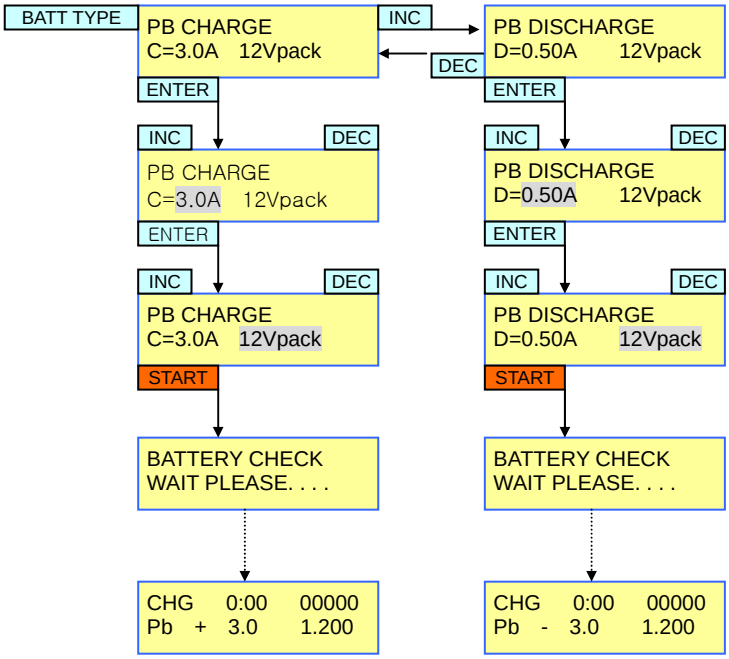
LiPo DISCHARGE
D=0.50 A 3S

Setting discharge parameters
Adjust to the desired discharge current from 0.10A to 1.00A (0.01A per step) with INC & DEC button. Press the ENTER button to confirm setting. Set pack voltage, 1S~5S as in charging example above. Autocut occurs automatically at 3.0V per cell.

LITHIUM POLY MODE IS ONLY FOR LITHIUM BATTERIES WITH 3.7V/cell RATING!

Some Li-Ion types are rated at 3.6V/cell, and CANNOT BE CHARGED with the EOS 5i!

PB MODE *(lead-acid battery)*



PB CHARGE
C=3.0A 12Vpack

Setting charge current
Adjust and find the desired charge current which ranges from 0.1A to 5.0A with INC & DEC buttons. Press the ENTER button to confirm setting

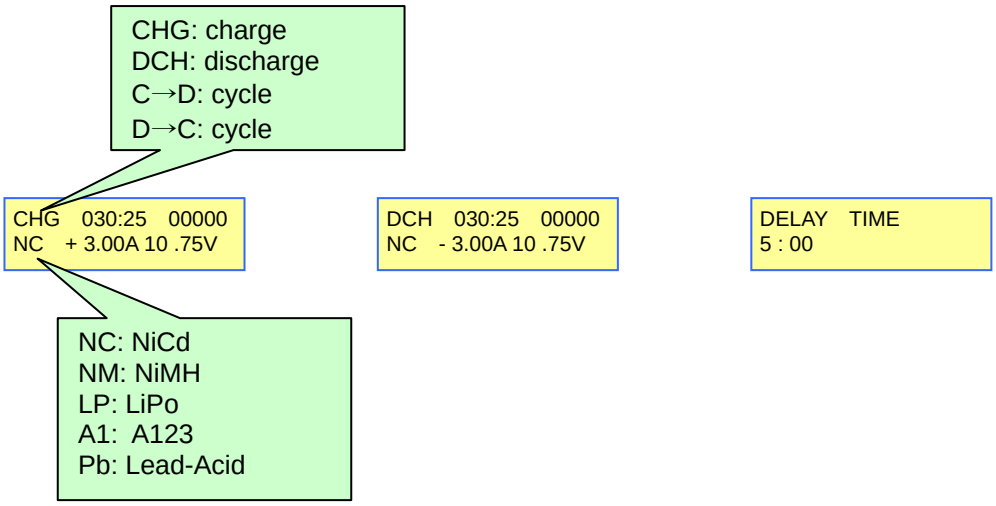
PB CHARGE
C=3.0A 12Vpack

Setting total battery voltage for Lead-Acid Battery
Select the proper total battery voltage to be charged or discharged with INC & DEC buttons – 2V, 4V, 6V, 8V, 10V, and 12V [2V per cell types only]

PB DISCHARGE
D=0.50A 12Vpack

Setting discharge current
Adjust and find the desired discharge current from 0.10A to 1.00A (0.01A per step) with INC & DEC button. Press the ENTER button to confirm setting.

Displays during charge, discharge, and cycle



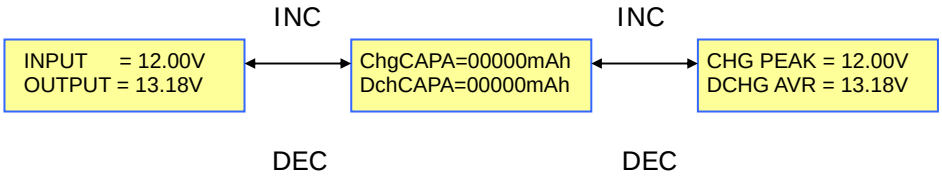
Completion display

When the Enter button is pressed, charge or discharge will be stopped.

END 030:00 00000
NC 100mA 10.75V

In order to move back to the main display, press the Enter button.

Data display



If the Battery type button is pressed for over 3 seconds, Data view will be displayed as above. Data displays can be scrolled left and right by INC & DEC buttons. If nothing pressed for 3 seconds, this display disappears.

LBA DATAPORT FEATURE

The DataPort is a 3-pin output which fits the option cable #HP-EOSLBA10-DPC. See top label to locate the DataPort on the top left side of your EOS charger. There are two main functions of the DataPort connection to LBA10 balance adapter:

*The LBA communicates with the charger, giving notification when balance charging is completed,or when an error is detected. In both cases, the LBA tells the charger to shut down. This insures maximum safety, and saves the user from having to manually push the charger STOP (enter) button to stop the charge-end or error tones. The lithium battery should be disconnected from the LBA as soon as possible after charging is completed.

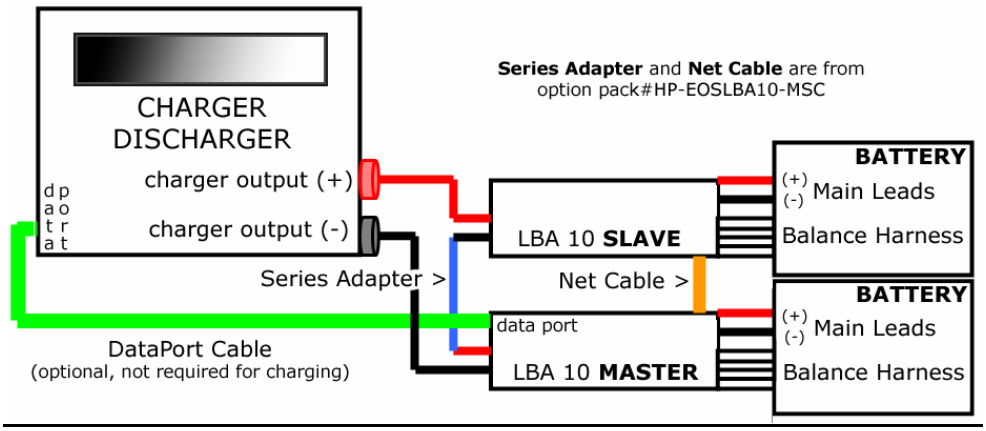
* The DataPort version EOS chargers, when connected to LBA10 balancer via cable #HP-EOSLBA10-DPC, allow the user to monitor the individual voltages of each battery cell during the charge process. This is an important addition to pack diagnostics, as one is able to see the exact balance status of the battery pack (or packs, when LBA10 is in NET mode).

To view individual cell voltages after the balance charge has been started:

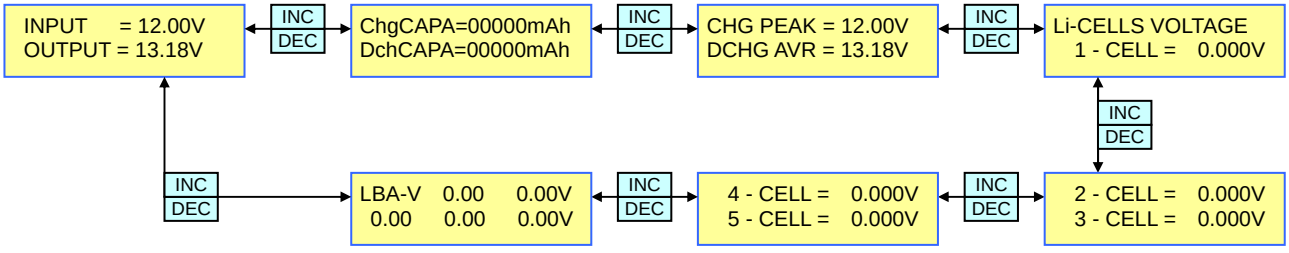
* Connect DataPort Cable (DPC) between Charger and LBA10 as shown by the Green line in diagram below. [no matter if single or networked LBA, connect DPC to Master LBA]

*Push the EOS5i BATT TYPE Button for 3 seconds to access DATA screen.

*Push the INC, DEC buttons to scroll up and down data screens as in the chart below.



Data Display with DPC Cable and LBA10 Balancer Connected



TROUBLESHOOTING

(1) Check again that the battery you are trying to charge and the settings on the EOS 5i match. Battery type (such as NiMH or Lithium), battery capacity, number of cells (charge voltage), and charge rate must all be correct.

(2) Check that the input cable and output cables:

*Have proper connectors in good condition
*Are not frayed, worn, cut, or damaged
*Are the proper gauge (2.5mm, 14ga)
*Are proper length - 20cm (8") on output side

(3) Attach the charger input connectors to a 12V automotive battery that is in good condition and fully charged. Wiggle the Terminal clips into the battery posts to insure that you have a good connection. Many charger problems are due to poor quality or inadequate switching AC-DC power supplies, so this test is necessary to eliminate those from the list of suspects.

(4) Try another battery for charging. If your RC battery is in poor condition, **over discharged**, or in some other way defective the charger may correctly refuse to charge it based on safety algorithms.

(5) Try another RC battery type. For example switch to a NiMH battery if you are failing to charge Lithium types. Success with one type but failure with another generally indicates that the charger is working properly. The failing battery type is almost certainly in poor condition, then, or you have improperly set the charger for it.

(6) Contact your dealer with full details and description of the problem, including the type of input power source, RC battery type and cell count, and history of the charger - specifically, has the charger been working properly before, or failing from new condition?

ERROR MESSAGES	
INPUT VOLTAGE ERROR	Input voltage is below 11.0V or exceeds 15.0V
NO BATTERY	Battery not detected
OUTPUT BATT REVERSE POLARITY	Battery is connected in reverse polarity to Output leads
OUTPUT CIRCUIT PROBLEM	Non-Specific Circuit error. Check battery condition
CHECK BATT OPEN CIRCUIT	Battery disconnected during charging
CHECK BATT OVER VOLTAGE	Battery voltage too high to match charger settings
CHECK BATT LOW VOLTAGE	Battery voltage too low to match charger settings
DATA RANGE OVER ERROR	LBA10-A Mode and Charger mode don't match (LIPO vs. A123) **OR** Original LBA10 is connected via DataPort Cable and Charger is set for A123 cell type

WARRANTY

HYPERION Chargers are guaranteed to be free from defects in materials and workmanship for a period of one calendar year from date of purchase. Your selling dealer is your first point of contact for warranty issues. Return postage costs are the responsibility of the user in all cases. Submit copy of original receipt with the return.

Damage due physical shock (dropping on the floor, etc), inappropriate power supply (automotive battery charger, etc!), water, moisture, and humidity are specifically NOT covered by warranty. It is well to carefully check your charger before making a return, as problems in setup, cabling, or power supply are much more common than defects in the charger.

Enjoy the Power!

The Hyperion Team